

## Chapter 2

# Functional Anatomy of the Female Sex Organs

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**Keywords** Anatomy • Vagina • Clitoris • Uterus

### Introduction

The emphasis of the study of the female sex organs has long been on understanding its reproductive role rather than sexual responsiveness. The majority of anatomic descriptions for these organs have been from the context of reproduction. Yet, there is a growing awareness that while sharing some of the same anatomical structures and hormonal milieu, sexual function and fertility/reproductive function are distinct, with unique physiological responses.

The following is a brief presentation of the anatomy and histology of the female sex organs, from the perspective of understanding the pathophysiology of sexual function.

### General Structural Relationships

The external genitalia are referred to collectively as the vulva and consists of the mons pubis, clitoris and bulbs, labia majora, and labia minora (Fig. 2.1). The *mons pubis* is an area of fatty tissue overlying the pubic symphysis,

covered by pubic hair. The body of the *clitoris* extends into the mons for several centimeters, before bifurcating into the crura, which run bilaterally under the inferior pubic rami. Between the crura lie the clitoral bulbs, draped over the *urethra*, with the bulk of their tissue lateral to the vaginal walls (Fig. 2.2). Only the glans clitoris is visible externally, approximately 1 cm superior to the urethral meatus. The *labia majora* are fatty, elongated, hair bearing folds of tissue forming the lateral boundaries of the vulva. The medial aspects of the labia majora fuse with the *labia minora*, which are thin folds of skin outlining the *introitus*, or entry to the vagina. The anterior aspects of the labia minora split and fuse with the ventral aspect (or frenulum) of the glans clitoris and also unite over the glans as a hood, known as the clitoral prepuce. The posterior aspects of the labia minora fuse in the midline at the lower aspect of the introitus. The urethra is located immediately superior to the introitus.

The internal genitalia are comprised of the vagina, the uterus (including cervix), uterine tubes, and ovaries (Fig. 2.3). The vagina is immediately posterior to the urethra and bladder and extends from the perineum superiorly and posteriorly toward the cervix, which protrudes into the vagina at approximately a 90° angle. The uterus typically is positioned posterior and superior to the bladder. Posterior to the vagina is the rectum. Loops of intestine are found superior and posterior to the uterus. The ovaries and uterine tubes extend laterally from the superior aspect of the uterus.

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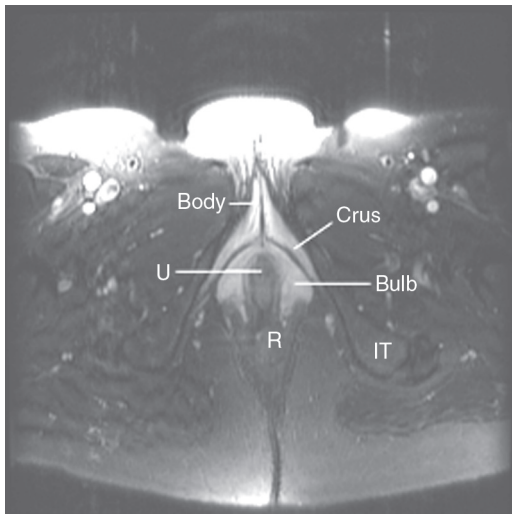
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**Fig. 2.1** Female external genitalia (premenopausal woman) (Image from [http://commons.wikimedia.org/wiki/File:Womans\\_vulva.jpg](http://commons.wikimedia.org/wiki/File:Womans_vulva.jpg). Under GNU Free Documentation License.)

## External Genital Anatomy

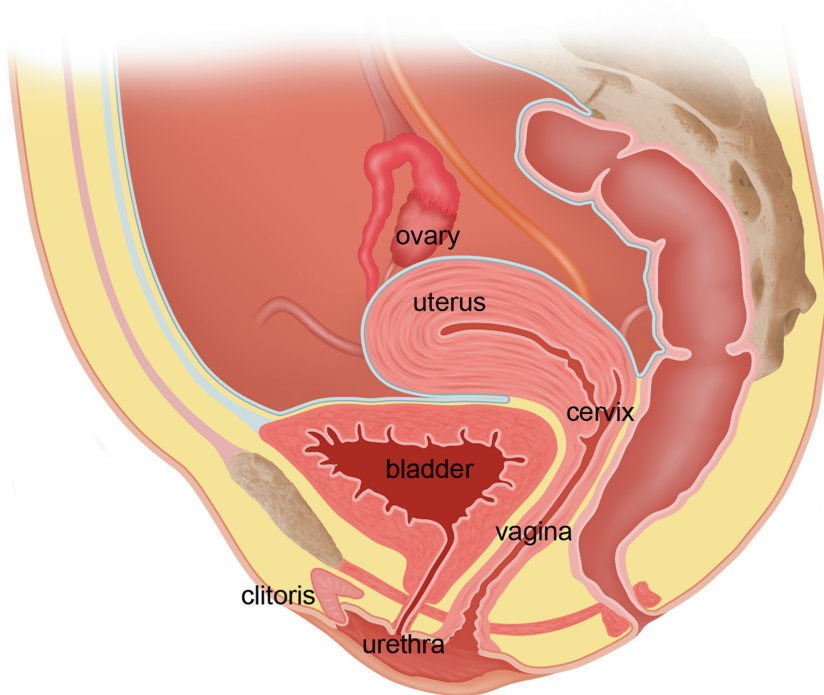
Gross anatomical and histological study of the clitoris, clitoral bulbs, labia minora, and urethra reveals them to contain specialized vascular tissues that are sexually responsive [1] and consist of two histologically distinct types of vascular tissue. The first type is the trabeculated erectile tissue seen in the clitoris and the bulbs. Gross examination of these structures demonstrate large, dilated vascular spaces that are filled with blood and are spongy in appearance (Fig. 2.4). On histological examination, the erectile tissues are trabecular, with smooth muscle underneath the epithelium of the vascular spaces. The erectile tissue of the clitoris and bulbs is very similar to that of the male corpora cavernosa and corpus spongiosum. In contrast to the clitoral and bulbar erectile tissue, the labia minora and glans clitoris are composed of nonerectile vascular tissue in which the blood vessels are dispersed within a fibrous matrix, with only a minimal amount of smooth muscle. Nonerectile, sexually responsive vascular tissue is also found surrounding the urethral lumen and within the walls of the vagina (see below).



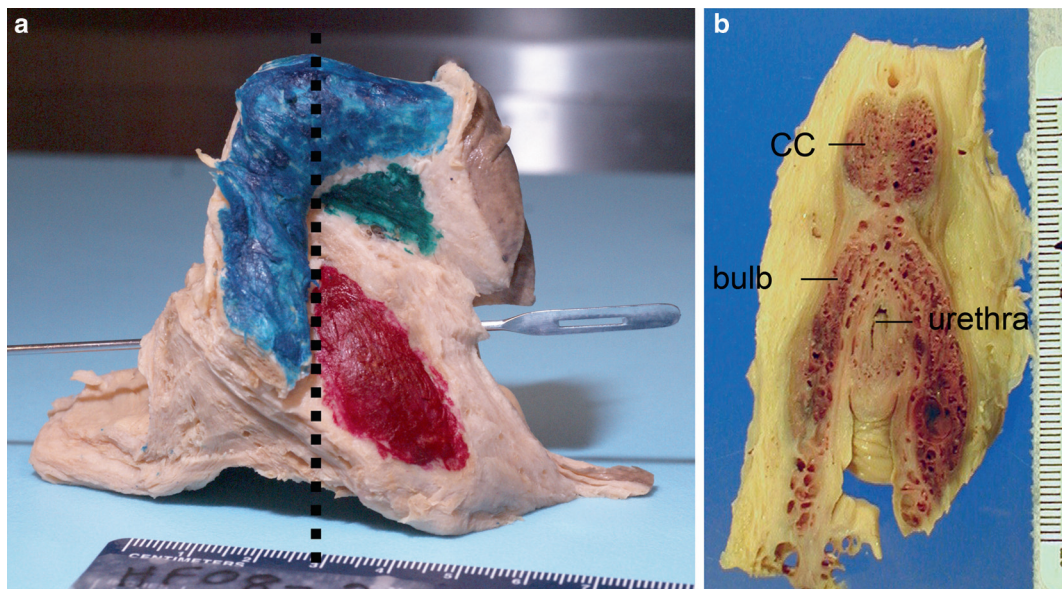
**Fig. 2.2** Axial view of female genitalia, magnetic resonance image. The high intensity signal of the clitoris and the bulbs is a function of the high blood flow within these structures. (The high signal intensity of the mons and surrounding tissue is artifact.) *Body* body of clitoris; *Crus* clitoral crus; *U* urethra; *R* rectum; *IT* ischial tuberosity (image courtesy of Kenneth R. Maravilla, MD)

## Clitoris

The structure of the clitoris has been “rediscovered” many times over the years by anatomists due to the frequent omission or misrepresentation of the organ in historical and contemporary anatomical texts. The clitoris is comprised of two erectile bodies, the corpora cavernosa. The body is the convergence of two corpora, and the crura are the extensions of the corpora beneath the descending pubic rami. Each of the corpora cavernosa is surrounded by a thick fibro-elastic tunica albuginea (Fig. 2.5). Because the majority of the clitoris is hidden by the mons pubis, there is a lack of appreciation for the substantial nature of these erectile bodies in the vulva (Fig. 2.4). The clitoral body and the crura can be 10 cm or more in length with the body measuring 5–7 cm in length.

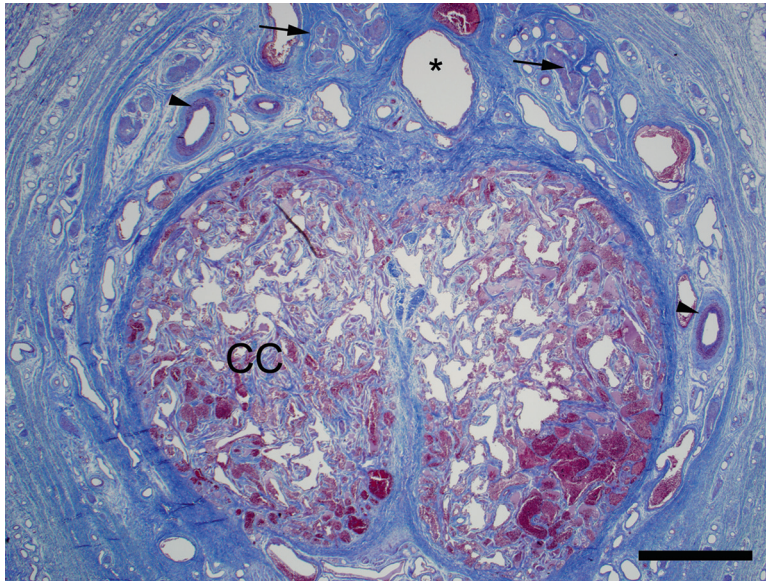


**Fig. 2.3** Female internal genitalia, sagittal view (based on drawing by Robert Holmberg, Seattle, WA)



**Fig. 2.4** Clitoris and bulb. (a) Gross sagittal view of external genitalia. Clitoris is inked *blue*, with body extending anteriorly into mons pubis and prepuce (glans not visible), and right crus amputated. Skin appears *dark brown*, and subcutaneous tissue is *tan*. Pars intermedia, a collection of vessels between the clitoral body and urethra, is stained *green*. Right clitoral bulb stained *red*. Metal probe placed through urethral lumen (not visible). *Vertical line*

indicates the approximate level of the cross-section seen in adjacent image 1.4b. Centimeter ruler. (b) Axial view of genital cross-section. The darker colored tissue is erectile tissue with residual pooled blood. The large, dilated vascular spaces are apparent in the clitoral body and the bulbar tissue draped over the urethral lumen. The rugae of the anterior vaginal wall is seen beneath the urethral lumen. Width of clitoral body approximately 1.5 cm

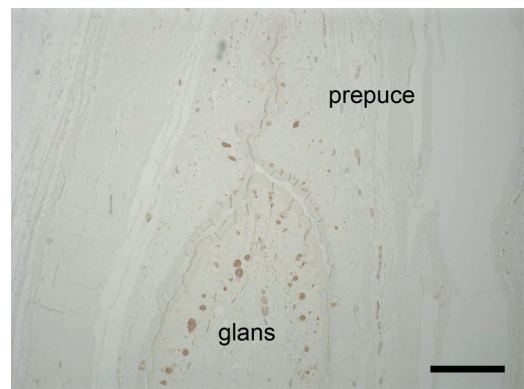


**Fig. 2.5** Midshaft cross-section of clitoral body, Masson's trichrome stain. Collagen/connective tissue stained *dark blue*, smooth muscle (and residual pooled blood) stained *red*. The two corpora cavernosa converge to form the clitoral body. They are surrounded by a fibrous tunica albuginea and separated by a fibrous septum.

Dilated vascular spaces comprise the erectile tissue of the corpora, some filled with residual corpuscles. Surrounding the tunica, particularly on its dorsal surface, is a collection of arteries, veins, nerves, and supporting tissue. *Arrowhead* artery; *arrow* nerve fascicles, *asterisk* vein. Bar=1 mm

The glans clitoris rests as a fibrovascular cap at the tip of the clitoral body. Unlike its male counterpart, the glans clitoris lacks smooth muscle within its fibrovascular cap, thus differentiating it from the erectile tissue of the clitoris and bulbs. Despite its diminutive size, the glans clitoris is richly innervated and is an important mediator of sensory input for sexual arousal (Fig. 2.6). The clitoris appears to be a purely sensory organ [2].

On histological examination, the clitoral tissue is composed of large vascular spaces with mainly vascular epithelium and smooth muscle interspersed throughout. The trabecular nature of the erectile tissue allows for engorgement and expansion during sexual arousal.



**Fig. 2.6** Longitudinal section of clitoral glans and body, S100 antibody stain. Neural elements are stained *brown*. The bulbous head of the glans is surrounded by preputial tissue. Just beneath the epithelium of the glans is an abundance of neural elements, including nerve fibers and receptors. Bar=1 mm

## Bulbs

The clitoral bulbs drape over the urethra (similar to a saddle bag) with the two globular bulbs lying

inferior to the clitoral body (Fig. 2.4). The bulbs are also referred to as the vestibular bulbs, but are more closely related to the clitoris than the vestibule [3]. The bulbs lie flanking the urethra

and vagina and sit recessed within the vestibule. They do not surround the introitus as suggested by some texts. There is no tunica albuginea enveloping the erectile tissue.

The size of the bulb varies between individuals and may be dependent on age and estrogenization. The bulbs are considered the equivalent of the male spongiosum, but the bulbs do not completely encircle the urethra. The histologic features of the bulb are similar to that of the clitoris. The erectile tissue of the clitoris has slightly less smooth muscle and interstitial fibro-elastic tissue, while the bulbs have more prominent fibro-elastic tissue and smooth muscle bundles lining the vascular spaces (Fig. 2.7).

During sexual arousal, the bulbs become engorged with blood. The bulbar trabecular tissue and the absence of a tunica allow for significant enlargement of the organ with increased blood flow during sexual arousal. The expansion

of the bulbs and their subsequent encroachment on the introital opening may contribute to a sensation of genital engorgement.

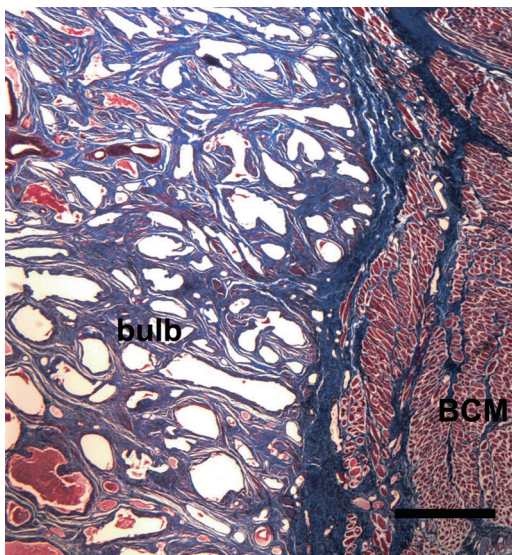
### Labia Majora

The labia majora are two elongated folds of skin that extend between the mons pubis and the perineal body (Fig. 2.1). They enclose the labia minora, glans clitoris, and the vaginal introitus. They are hair bearing, pigmented skin folds. The subcutaneous tissue of the labia majora consists mostly of fat. They also contain the terminations of the round ligaments, some smooth muscle bundles, sparse nerves, and blood and lymphatic vessels. The labia majora change with sexual arousal, from what appears to be passive vasocongestion, rather than active increase in blood flow as occurs in the other parts of the vulva.

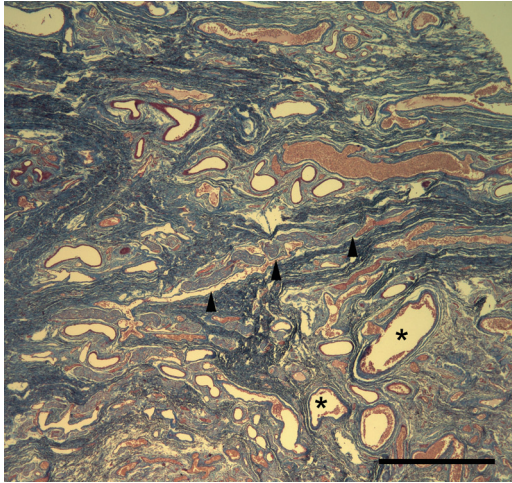
### Labia Minora

The labia minora are folds of tissue between the introitus and labia majora (Fig. 2.1), and unlike the labia majora, they contain very little adipose. This skin is generally smooth, hairless, and pigmented. There is great variation in the size and shape of the labia minora between individuals. There can be some degree of atrophy with decreased estrogenization. Trauma due to childbirth and other types of irritation of the labia minora can result in asymmetric hypertrophy.

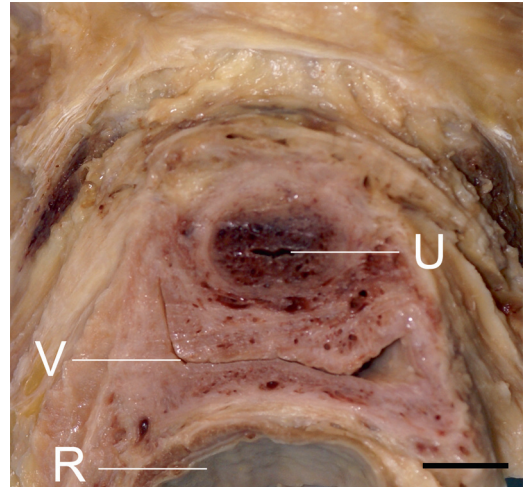
Numerous vascular structures of varying sizes are surrounded by collagenous connective tissue, not smooth muscle (Fig. 2.8). The tissue immediately deep to the epithelium is nontrabecular (nonerectile) vascular tissue. This is in distinction to the trabecular vascular tissue of the clitoris and bulbs, designed to accommodate large volumes of blood during arousal. Elastin is abundantly present, presumably to allow for labial engorgement and enlargement during sexual arousal, since there is very little smooth muscle and no trabecular erectile tissue within the labia minora. Vascular structures in the labia minora are more numerous than in the labia majora.



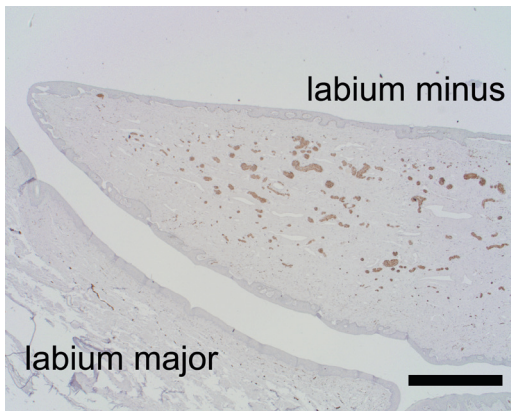
**Fig. 2.7** Clitoral bulb, Masson's trichrome stain. Collagen/connective tissue stained dark blue, smooth muscle (and residual pooled blood) stained red. The erectile tissue of the bulb, like that of the clitoris, is comprised of trabecular vascular spaces designed to accommodate large volumes of blood during sexual arousal. In contrast to the clitoris, there is no surrounding tunica albuginea. Skeletal muscle of the bulbospongiosus muscle (BSM) is seen to the right side of the image. Bar=1 mm



**Fig. 2.8** Labium minus, elastic Masson's trichrome stain. The substance of the labium minus is filled primarily with collagen (dark blue stain), interspersed with elastin fibers (black wavy lines). Dilated vascular spaces are evident, many filled with red corpuscles (two examples designated by asterisks). Large nerve trunks traverse through this specimen, one identified by arrowheads. Bar = 1 mm



**Fig. 2.10** Urethra, vagina, rectum gross specimen, axial cross-section approximately 3 cm proximal to urethral meatus. The dark tissue surrounding the urethral lumen is nonerectile vascular tissue. The collapsed vagina is seen between the urethra and rectum. Vessels are apparent in the substance of the vaginal walls, also considered nonerectile vascular tissue. U urethral lumen; V vagina; R rectum. Bar = 1 cm



**Fig. 2.9** Labium minus and labium major cross-section, S100 antibody stain. The rich innervation of the labium minus is evident with the staining of neural elements. The labium major specimen is fractured due to processing. Bar = 1 mm

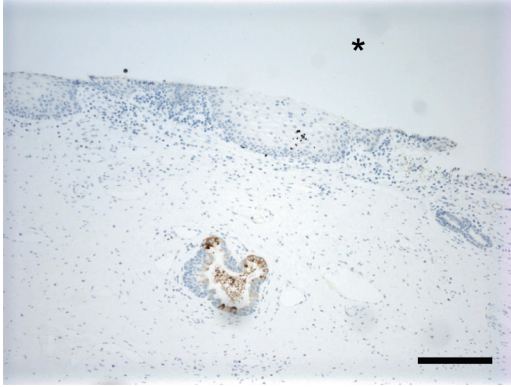
Neural fibers and receptors are abundantly apparent within the labia (Fig. 2.9). There is a central core of neural elements which is present along the length of each labium. This neural core appears to travel alongside the major vascular structures within the labium minus and is the neurovascular substrate through which labial

engorgement occurs in response to sexual arousal. This is in contrast to the labia majora, where nerve fibers and receptors are sparse.

Given the generous vascular and innervation patterns within the labia minora, as well as evidence that the tissue is sexually responsive [4], there is good reason to believe that alteration of the labia minora can change sexual responsiveness. Exenterative procedures, such as vulvec-tomy, reduction labiaplasty, and certain forms of female circumcision, can have a deleterious effect on the sexual response by ablating the substrate through which sexual sensations enter the central nervous system.

## Urethra

The urethra is a midline structure and sits deep within the introitus. It is a rugated muscular tube that is lined by stratified squamous epithelium, which becomes transitional epithelium as it approaches the bladder. The distal urethra is flanked by the erectile tissue of the clitoral bulbs. The urethral tissue bears a nonerectile vascular pattern (Fig. 2.10) and engorges with sexual



**Fig. 2.11** Periurethral gland, PSA stain. The urethral tissue surrounding the lumen includes occasional glands that stain positively (*brown*) for prostate-specific antigen (PSA). The glandular elements, however, are not coalesced into any macroscopic organ. Asterisk designates urethral lumen. Bar=0.1 mm

arousal. It is surrounded by the erectile tissue of the clitoral bulb, but the urethra itself contains no erectile tissue.

There are paraurethral glands along the length of the lumen. Some of these glands stain positively for prostate specific antigen (PSA) [5], leading some to state that this area is homologous to the male prostate. However, the glands are isolated (Fig. 2.11) and do not have any recognizable endocrine or exocrine function in women (the exocrine function of PSA is to liquefy semen). The region of the anterior wall of the vagina overlying the midurethra has been identified as the Grafenberg spot (or “G-spot”), an area that in some women is particularly sensitive to tactile stimulation. Numerous anatomical studies of the area have not identified gross or histological findings to distinguish it from other parts of the urethra or vaginal wall [6].

### **Blood Supply of the External Genitalia**

The main source of blood supply for the pelvis is the internal iliac, or hypogastric, artery. From this, the internal pudendal artery gives off multiple variable branches, including the dorsal artery of the clitoris, the perineal artery, posterior labial

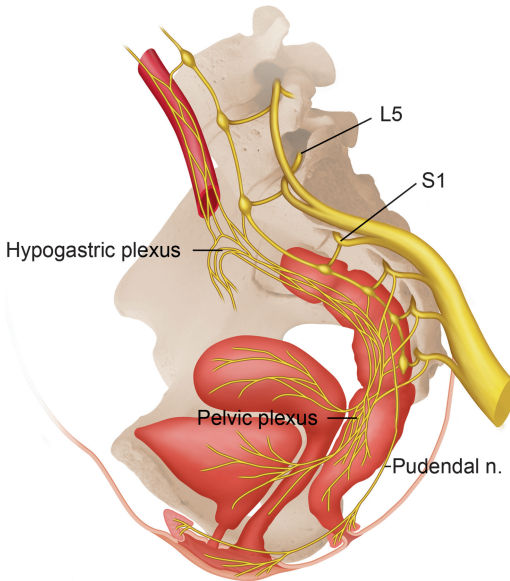
artery, artery to the bulb, as well as the deep artery of the clitoris, which is centrally located in the erectile tissue of the corpora cavernosa. Small branches also supply the vaginal wall [7]. The venous drainage of the clitoris and bulb is via the deep dorsal vein, which then drains into the vesical venous plexus within the pelvis.

A secondary source of blood supply to the external genitalia arises from the femoral artery. A branch of the femoral artery, the external pudendal artery, divides into a series of anterior labial branches to supply the labia majora and labia minora. The external pudendal artery enters laterally from the thigh and tracks towards the vulva to join with the posterior labial arteries from the internal pudendal artery. The venous drainage of the labial skin is via the external pudendal vein, which drains into the greater saphenous vein. There is variation in tissue vascularity with age, with less vascular structures found in older women compared to younger women.

### **Innervation of the External Genitalia**

The innervation of the external genitalia involves both somatic and autonomic fibers (Fig. 2.12). The pudendal nerve, arising primarily from spinal segments S2–4, is the main source of somatic innervation and its terminal branches to the genitalia are the dorsal nerve of the clitoris (DNC) and perineal nerve. A third branch of the pudendal nerve, the inferior rectal nerve, provides innervation to the perirectal skin, the anal sphincter, and parts of the musculature of the posterior pelvic floor. The DNC is exclusively a sensory nerve, innervating the clitoris (crura, body, and glans). The perineal nerve provides sensory innervation to parts of the labia majora, the labia minora, introitus, distal urethra, and perineal skin, as well as motor innervation to the external urethral sphincter, and much of the pelvic floor skeletal musculature.

Multiple studies have examined the pathway of the DNC, and there is still some controversy regarding its exact course. Anatomic dissections in our lab have shown the DNC to run in parallel

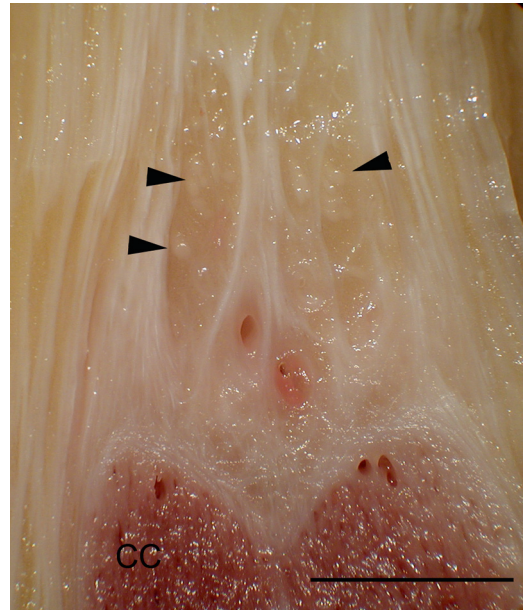


**Fig. 2.12** General pattern of genital innervation. The somatic innervation of the female sex organs is mediated primarily through the pudendal nerve (S2–4). The sympathetic innervation is derived from T10 to T12, and the parasympathetic innervation is derived from S2 to S4. Not shown are autonomic fibers from the pelvic plexus to the erectile tissue of the clitoris and bulbs (based on drawing by Robert Holmberg, Seattle, WA)

to the crura under the inferior pubic symphysis prior to ascending at the pubic ramus and proceeding within the suspensory ligament towards the glans clitoridis (unpublished data) (Fig. 2.13).

Other areas of the vulva are innervated via nonpudendal fibers. Parts of the labia majora are innervated by the anterior labial branches of the ilioinguinal nerve.

The cavernous nerves carry the autonomic innervation to the erectile tissue of the clitoris and bulbs. While the DNC is visible to the naked eye, the fibers of the cavernous nerves are too small to identify without magnification. These sympathetic and parasympathetic fibers arising from the caudad thoracic spinal segments and the sacral spinal segments innervate the vessels and smooth muscle of the erectile and nonerectile vascular tissue of the vulva. (A more detailed description of the spinal origins of the autonomic fibers is described in section “Innervation of the Internal Genitalia.”)



**Fig. 2.13** Suspensory ligament and clitoris, gross view. The suspensory ligament is an acellular ligament that attaches the body of the clitoris to the symphysis pubis. White strands of the ligament are seen, surrounded by adipose. The ligament attaches to the dorsal aspect of the clitoral body. Within the strands of the suspensory ligament, nerve fascicles of the DNC travel toward the glans (cut ends of the nerves designated by arrowheads). The fascicles occur bilaterally, just lateral to the midline. CC corpus cavernosum. Bar=5 mm

## Internal Genital Anatomy

### Vagina

The vagina is a flattened fibromuscular tube whose anterior and posterior walls are collapsed onto each other, extending from the introitus to the fornices that surround the cervix (Fig. 2.10). A longitudinal ridge is present along the mucosal surface of both the anterior and posterior walls; from these ridges, secondary elevations called rugae extend laterally. The vaginal wall consists of three layers: (1) the stratified squamous nonkeratinized epithelium and an underlying lamina propria of connective tissue; (2) the muscular layer, composed of smooth muscle fibers disposed both longitudinally and circularly; and (3) the adventitia, a dense connective tissue that blends with the surrounding fascia.

The lamina propria and connective tissue layers contain a rich supply of vascular channels. During sexual stimulation, the marked increase in fluid production in the vagina is believed to be caused by transudation across the vaginal wall. The transudate provides the lubrication needed for nonpainful and nontraumatic vaginal intercourse. There are no glands in the vaginal wall.

The stratified squamous epithelium of the adult vagina is several layers thick. The basal layer is a single layer of cylindrical cells with oval nuclei. Above this area are several layers of polyhedral cells that appear to be connected together much like those of the stratum spinosum of the epidermis. Above these are several more layers of cells that are flatter in appearance and accumulate glycogen in their cytoplasm. The most superficial cells are desquamated into the vaginal lumen where their intracellular glycogen is converted into lactic acid, probably by normal vaginal bacteria flora. The resulting acidity is believed to be important in protecting the female reproductive system from infection by most pathogenic bacteria.

Estrogen stimulates the production of glycogen and maintains the thickness of the entire epithelium. Before puberty and after menopause, when estrogen levels are relatively low, the epithelium is thin and the pH is higher than in the reproductive years (neutral before puberty and 6.0 or higher after the menopause). There is also much less transudate formed with sexual arousal following menopause.

The vaginal introitus is surrounded by the striated skeletal musculature of the pelvic floor, including the levator ani (iliococcygeus, pubococcygeus, puborectalis), the bulbospongiosus muscles, and the superficial and deep transverse perineal muscles. There is no discrete vaginal “sphincter,” although the pelvic floor muscles in aggregate functionally contract the introital opening.

## **Uterus**

The uterus is a muscular structure suspended in the pelvis by an arrangement of ligaments and supported inferiorly by the pelvic floor (Fig. 2.3).

Its anatomy and histology is designed to accommodate the developing ovum, and it varies in size, shape, location, and structure as a result of hormonal fluctuations, pregnancy, age, and other circumstances. The reproductive physiology associated with this organ is beyond the scope of this chapter; the basic anatomy and histology, in the context of sexual function, will be described here.

### **Uterine Corpus (or Body)**

The uterine corpus is a thick, pear-shaped organ, somewhat flattened anteroposteriorly. The wall of the body of the uterus is composed of three layers: (1) the endometrium, a glandular mucous membrane; (2) the myometrium or smooth muscle layer; and (3) the serosa.

The function of the endometrium is to provide a suitable environment for the implantation and subsequent growth of the developing embryo. As such, it is a luxuriant mucosa with a large population of glycogen-secreting glands and a rich vascular network. However, if there is no developing embryo implanted during a menstrual cycle, most of the endometrium is sloughed off (causing the menstrual flow) and is regenerated again in the next menstrual cycle. This cyclic shedding and regeneration of the endometrium is under the control of the ovarian hormones, estrogen and progesterone.

The myometrium consists of bundles of smooth muscle fibers separated by strands of connective tissue. Four layers of smooth muscle have been distinguished, but their boundaries are poorly defined owing to overlap between adjacent layers. Estrogen is essential for the maintenance of normal size and function in myometrial smooth muscle cells.

The serosa is the peritoneal covering of the uterus, attached to the uterus at the fundus and body. Four paired sets of ligaments are attached to the uterus (broad, round, cardinal, uterosacral) as well as peritoneal reflections (vesicouterine, rectovaginal, sacrogenital) that also support the uterus within the pelvis.

## Cervix

The cervix is located at the inferior aspect of the uterus and is generally 2–3 cm in length. It consists primarily of dense collagenous connective tissue. Only about 15% of its substance is smooth muscle. In the uterine isthmus (the transition of the corpus to the cervix), the uterine lumen narrows down to form the internal os. Below this point, the lumen widens slightly to form the cervical canal (or endocervical canal). The external os at the lower end of the cervix provides communication between the lumen of the cervix and the vagina.

Inside the cervix, the endocervical mucosa is arranged in a series of folds and ridges. A longitudinal ridge runs down the anterior wall and another down the posterior wall; from each of these, small folds run laterally. The ectocervix is the part of the cervix that projects into the vagina and is covered by stratified squamous, nonkeratinizing epithelium.

Although it is considered primarily a reproductive organ, there is clinical evidence that the uterus and cervix do contribute to the sexual response.<sup>8,9</sup> However, their relative contributions to sexual satisfaction may not be significant, according to studies that demonstrate improved sexual functioning following hysterectomy for benign disease.<sup>10,11</sup> The exact mechanisms are unknown to explain sexual function changes following uterine surgery, whether it is caused by the alteration of local nerve [8] and blood supply, or by changing anatomical relationships.

## Ovaries and Uterine Tubes

The ovaries are the germinal and endocrine glands of the female, contributing to the hormonal milieu in which the sexual response occurs. It is not known if the ovaries have any other function with regard to the sexual response and are typically not thought to undergo structural changes with sexual arousal. The uterine tubes are also not considered to be sexually responsive. They will not be discussed in this chapter.

## Blood Supply of the Internal Genitalia

The pelvic organs are all supplied by a single arterial trunk, the internal iliac (hypogastric) artery. It forms with the bifurcation of the common iliac artery at the junction of the sacrum and the ilium. Descending in the lateral pelvis below the peritoneal reflection, the internal iliac artery gives off a series of visceral branches including the rectal, uterine, and vesical arteries. These course medially to enter the endopelvic space, at the base of the broad ligament. Before reaching the uterus, the uterine artery gives branches to the vagina and cervix. Within the broad ligament, a series of arterial branches is given to the body of the uterus until the uterine artery anastomoses with the ovarian artery at the uterotubal junction.

The uterine vein is usually plexiform, coursing laterally in the base of the broad ligament following the uterine artery before reaching the lateral pelvic wall. Here the plexus of veins forms a series of tributaries entering the internal iliac vein, which in turn empties into the inferior vena cava.

## Innervation of the Internal Genitalia (see Fig. 2.12)

The uterus and vagina are innervated by autonomic and visceral afferent (sensory) fibers, which run along the uterine arteries. Sensory fibers from the uterine body descend in the parametrium (the lateral extension of the uterine subserosal connective tissue into the broad ligament) to join other fibers from the cervix to form a large plexus in the paracervical region called the uterovaginal plexus. These fibers then come in with visceral afferents from other pelvic viscera, before entering the inferior hypogastric plexus. Ascending the sacral promontory, the fibers join the superior hypogastric plexus and enter the sympathetic chain via lumbar splanchnic nerves. From the sympathetic ganglia, white rami communicans conduct fibers to the dorsal roots of spinal nerves T10–12. The

utero vaginal plexus also includes parasympathetic motor fibers from sacral roots that enter the pelvis directly, as well as sympathetic motor fibers that enter from the sympathetic chain. The vaginal introitus is supplied by sensory fibers of the pudendal nerve. Contrary to many texts, the lower two thirds of the vagina is not somatically innervated; only the introitus and the first 1–2 cm of the distal vagina appear to have somatic sensation.

A comparative immunohistochemical study of the pelvic autonomic nerves to the uterus revealed that standard technique of radical hysterectomy results in transection of the uterosacral ligaments, disrupting the major part of the hypogastric nerve. However, following the nerve-sparing technique of hysterectomy, only the medial branches of the hypogastric nerve appeared disrupted [9]. Division of the cardinal ligaments in the standard procedure identified the inferior hypogastric plexus running into the most posterior border of the surgical margin. The anterior part of the plexus was disrupted. Dissection of the nerves after the nerve-sparing procedure showed that the anterior part of the plexus was not involved in the surgical dissection. Dissection of the vesicouterine ligament disrupted only small nerves on the medial border of the inferior hypogastric plexus in both techniques. Whether this translates to improved postoperative sexual functioning in women with a nerve-sparing hysterectomy has not been definitively determined.

Understanding the causes of sexual dysfunction is dependent on a clear understanding of the pertinent genital anatomy. Recent research in female genital anatomy has clarified the nature of these structures, particularly in regard to their role in the sexual response. The vascular tissue of the genitalia, particularly of the vulva, is the anatomic substrate by which pelvic engorgement can occur during arousal. These

tissues are erectile and nonerectile, and both types are sexually responsive. Other genital structures are not known to have direct motor responses during the sexual response, but may contribute to the sensory input required to generate and propagate the sexual reflexes. Malignancies involving the genital structures, or the treatment of malignancies, can affect the sexual response by direct injury or ablation, or indirectly by disruption of the vascular, neural, or hormonal supply to the genitalia.

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